

Comparing coaxial cable shielding effectiveness

Radiation from coaxial cables has always been a concern of design engineers. That concern has been intensified by the most recent FCC document on cable TV sys-

tem radiation, which all CATV systems must now meet. And although these requirements apply to the CATV system as a whole (the cable, connectors, splitters, amplifiers, and other components), the allowable radiation levels for coaxial cables must be kept to a minimum for good shielding effectiveness.

Whether you're looking for a low-cost coaxial cable for short runs that will meet the FCC specification, or merely comparing effectiveness of the different shielding configurations, the following curves should prove helpful. The curves supplied by Belden Corp.'s Electronic division, Chicago, show the results of shielding

Electronics/November 6, 1972

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effectiveness tests on RG/59/U-type CATV drop cable (for short runs from main cable to a subscriber's house) from 5 megahertz to 270 MHz.

The top curve illustrates the relative effectiveness of a shielding configuration consisting of Belden Duofoil film-sandwiched aluminum foil, plus a 61% shield coverage of tinned copper braid. The other two curves detail the isolation performance of 59/U-type CATV drop cables without foil and with different amounts of tinned-copper-braid shield.

The middle curve details isolation versus frequency

for a cable with 94.5% coverage braid (this kind is usually specified by the military services). The lower curve illustrates the shielding effectiveness of the same grade and style of cable, but with a relatively open 55% coverage braid.

All the curves dip in their values of isolation at about 70 MHz and 200 MHz. These dips result from quarter-wave resonance inherent in the 3-foot cable sample. Changing the sample length does not eliminate these resonance dips—it only alters the frequencies at which they occur. □

